



Topics to Consider in Creating a Mars Roadmap

- How do we capitalize on Core Products and commonality?
- What is an appropriate level of redundancy in capstone missions?
- What level/type of mission interdependency is appropriate?
- What is the nature and frequency Scouts?
- Human exploration precursors are needed for...
 - Technology demonstrations
 - Precursor measurements
- Does international partnering significantly affect missions or budgets?
- What is the effect on program risk, from any and all of these topics?



Assumptions for *Example* Scenarios

- MEP must remain responsive to science, and discoveries
 - Responsiveness to the Vision, and human precursor activities, are new MEP responsibilities
- Do not spread Scout opportunities beyond ability to capitalize on exciting discoveries, and keeping Scientific community engaged
- Ensure robustness in the Program portfolio (risk), while managing cost
 - Maximum of 3 launches in an opportunity
- Establish and maintain an infrastructure that supports both science and MHP missions
- Beyond the current President's budget (2010), MEP's budget increases only at the rate of inflation



Current Mars Exploration Program Next Decade—Pathway 1

2009



MTO

2011

Competed
Scout
Mission

2013

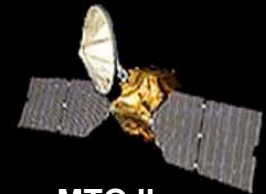


Sample Return
Orbiter

2016

Competed
Scout
Mission

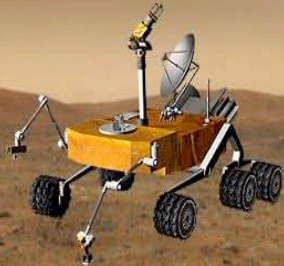
2018



MTO II

2 MSR Landers
w/ Fetch Rovers

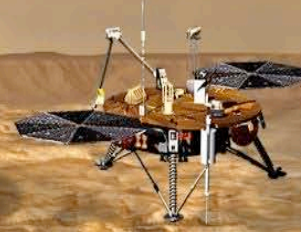
MSL



MHP-1 Testbed



MHP-2 Testbed



AFL

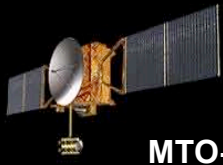
MHP-3
Testbed





Example MEP Portfolio-1

2009



MTO-1

Competed
Scout
Mission

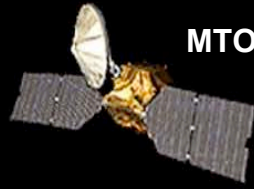
2011

MSL #1
MSL #2

MHP-1
Testbed



2013



MTO-2

Competed
Scout
Mission

2016



Sample Return
Orbiter

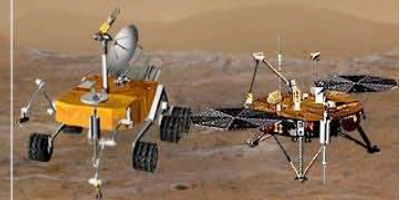
2 SR Landers / FR



2018

AFL

MHP-2
Testbed



Changes from Current

- 2011 Scout to 2009
- MSLs from 2009 to 2011, add one
- MTO-2 added in 2013
- MSR from 2013 to 2016
- 2016 Scout to 2013
- 2016 MHP-2 to 2018



Example MEP Portfolio-2

2009



MTO-1

Competed
Scout
Missions

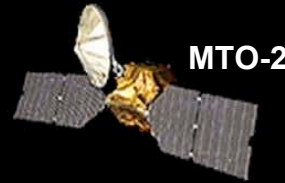
2011



MSL #1

MSL #2

2013



MTO-2

Competed
Scout
Mission

MHP-1
Testbed



2016

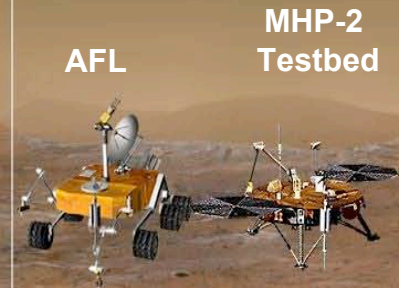


Sample Return
Orbiter

2 SR Landers / FR



2018



AFL

MHP-2
Testbed

Change from Portfolio-1

- 2011 Scout to 2009
- MSLs from 2009 to 2011, add one
- *MHP-1 from 2011 to 2013*
- *MTO-2 launch in 2013 (joint build)*
- MSR from 2013 to 2016
- 2016 Scout to 2013
- 2016 MHP-2 to 2018

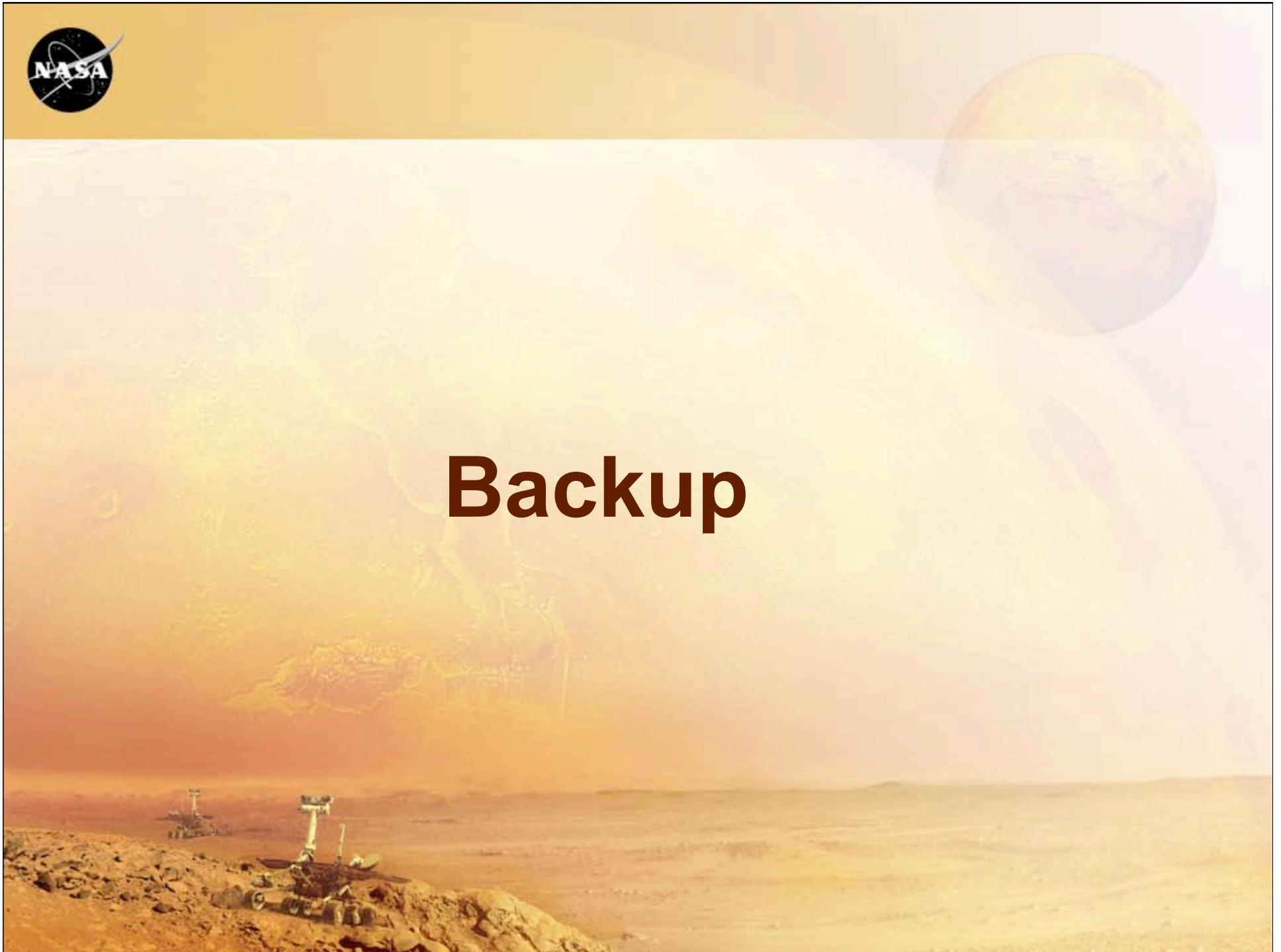


Examples Summary

	2009	2011	2013	2016	2018
<u>Current Program</u>	MTO MSL	Scout MHP Testbed-1	<u>MSR</u> Lander w/FR-1 Lander w/FR-2 Orbiter	Scout MHP Testbed-2	AFL MTO-2 MHP Testbed-3
<u>Portfolio-1</u>	MTO Scout	MSL-1 MSL-2 MHP-1 Testbed	Scout MTO-2	<u>MSR</u> Lander w/FR-1 Lander w/FR-2 Orbiter	AFL MHP-2 Testbed
<u>Portfolio-2</u>	MTO Scout	MSL-1 MSL-2	Scout MTO-2 (parallel) MHP-1 Testbed	<u>MSR</u> Lander w/FR-1 Lander w/FR-2 Orbiter	AFL MHP-1 Testbed



Backup





Aggressive Portfolio

Current Portfolio

2009	2011	2013	2016	2018
MTO MSL	Scout MHP Testbed	<u>MSR</u> Lander w/FR-1 Lander w/FR-2 Orbiter	Scout MHP Testbed	AFL MTO-2 MHP Testbed

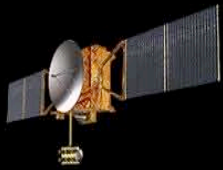
Aggressive Portfolio

2009	2011	2013	2016	2018
MTO MSL-1 MSL-2	Scout MHP Testbed	<u>MSR</u> Lander w/FR-1 Lander w/FR-2 Orbiter	Scout MHP Testbed	AFL MTO-2 MHP Testbed



Example Aggressive Portfolio

2009



MTO-1

2011

Competed
Scout
Mission

2013

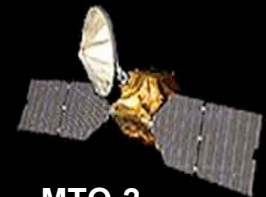


Sample Return
Orbiter

2016

Competed
Scout
Mission

2018



MTO-2

MSL #1

MSL #2



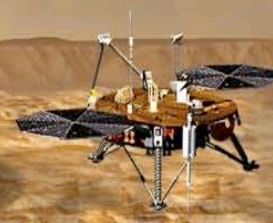
MHP Testbed



2 SR Landers / FR



MHP Testbed



AFL

MHP
Testbed



Changes from Current
- Added a second MSL in 2009